

00069US1.ST25
SEQUENCE LISTING

<110> Wood, Linda
Vogeli, Gabriel
Karnovsky, Alla
Linske-O'Connell, Lisa I.
Wang, Jun
Liu, Derong

<120> Human Ion Channels

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<150> 60/188,517

<151> 2000-03-10

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 aatctcttta gtgcagtagg acattaaatt tgctccctt ttctacttct tgccatcact 420
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<212> DNA
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 <212> DNA
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680

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 <211> 331
 <212> PRT
 <213> Homo sapiens

<400> 28

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 35 40 45
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 65 70 75 80
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 115 120 125
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 180 185 190
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 210 215 220
 Gly Gly Gly Gly Ala Cys Ala Ala Cys Thr Cys Ala Gly Ala Cys Ala
 225 230 235 240
 Thr Cys Cys Cys Ala Thr Cys Thr Thr Cys Cys Ala Thr Thr Gly Ala
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Cys Thr Ala Thr Ala Thr Thr Thr Thr Thr Gly Ala Gly Thr Gly Ala
260 265 270

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275 280 285

Cys Thr Cys Thr Cys Thr Ala Cys Cys Thr Thr Cys Ala Ala Ala Thr
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Thr Cys Ala Gly Cys Thr Thr Cys Thr Gly Thr Gly Gly Gly Ala Thr
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Cys Ala Thr Thr Gly Ala Thr Thr Ala Ala Ala
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<211> 610

<212> DNA

<213> Homo sapiens

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<210> 30

<211> 614

<212> DNA

<213> Homo sapiens

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 <213> Homo sapiens

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 <212> DNA
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 <212> DNA
 <213> Homo sapiens

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 <213> Homo sapiens

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 <213> Homo sapiens

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<211> 670

<212> DNA

<213> Homo sapiens

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<211> 652

<212> DNA

<213> Homo sapiens

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<211> 680
<212> DNA
<213> Homo sapiens

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<210> 44
 <211> 648
 <212> DNA
 <213> Homo sapiens

<400> 44
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 ttaattgtgt attcaaatgt caaggtatcc tagtacagaa aatatcagtg ggttattctg 180
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 <211> 585
 <212> DNA
 <213> Homo sapiens

<400> 45
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<210> 46
 <211> 642
 <212> DNA
 <213> Homo sapiens

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<210> 47
 <211> 657
 <212> DNA
 <213> Homo sapiens

<400> 47
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<210> 48
 <211> 446
 <212> DNA
 <213> Homo sapiens

<400> 48
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 atatttccat aattaatacg tttatattat gttactttta atggatgaat atgtatcgaa 180
 gccccatttc atttacatac acgtgtatgt atatccttcc tcccttcctt cattcattat 240
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 ggctgcggtg ggggtggggtg ggggtgg 446

<210> 49
 <211> 554
 <212> DNA
 <213> Homo sapiens

<400> 49
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 <211> 469

<212> DNA
 <213> Homo sapiens

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 tgtgtgcaga acaccctga gaacttgta aaataacggg tcctgagccc cagcccagag 240
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<210> 51
 <211> 445
 <212> DNA
 <213> Homo sapiens

<400> 51
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 cttgttgaat taatgatggg tttttacatt ttacttttc aaaaaatata atcaccactg 360
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 aaaaatctca atattatgat tataa 445

<210> 52
 <211> 60
 <212> PRT
 <213> Homo sapiens

<400> 52

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Pro	Ser	Ser	Phe	Leu	Val	Ala	Ile	Asp	Ala	Leu	Ser	Phe	Tyr	Leu	Pro
			20					25					30		
Ala	Glu	Ser	Glu	Asn	Arg	Ala	Pro	Phe	Lys	Ile	Thr	Leu	Leu	Leu	Gly
			35				40					45			

Tyr Asn Val Phe Leu Leu Met Met Asn Asp Leu Leu
 50 55 60

<210> 53
 <211> 26
 <212> PRT
 <213> Homo sapiens

<400> 53

Ser Ala Pro Trp Leu Ser Trp Gly Ile Leu Leu Ile Leu Gly Glu Gly
 1 5 10 15

Ser His Ala Pro Thr Ser Phe Tyr Ser Arg
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<210> 54
 <211> 22
 <212> PRT
 <213> Homo sapiens

<400> 54

Arg Thr Val Pro Pro Tyr Leu Tyr Asn Thr Asp Val Trp Phe Phe Phe
 1 5 10 15

Ile Arg His Tyr Pro Trp
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<210> 55
 <211> 33
 <212> PRT
 <213> Homo sapiens

<400> 55

Gly Gly Arg Arg Gly Ser Ser Leu Pro Gln Asn Pro Thr Gly Gly Pro
 1 5 10 15

Ser Ser Phe Cys Gly His Cys Ile Ser Leu Tyr Ile Leu Pro Pro Gln
 20 25 30

Arg

<210> 56
 <211> 35
 <212> PRT
 <213> Homo sapiens

<400> 56

Leu Leu Leu Leu Gly Asn Ser His Tyr Val Tyr Asp Gly Leu Ser Tyr
 1 5 10 15

Ser Val Phe Pro Ile Phe Phe His Ile Phe His Phe Leu Tyr Trp Ser
 20 25 30

Pro Phe Ser
35

<210> 57
<211> 37
<212> PRT
<213> Homo sapiens

<400> 57

Gly Asp Cys Arg Met Ala His Ala Glu Gln Lys Leu Met Asp Asp Leu
1 5 10 15

Leu Asn Lys Thr Cys Tyr Asn Asn Leu Asp Pro Pro Ser His Gln Leu
20 25 30

Leu Thr Ala His Leu
35

<210> 58
<211> 52
<212> PRT
<213> Homo sapiens

<400> 58

Asp Glu Arg Asn Gln Val Leu Thr Leu Tyr Leu Trp Ile Arg Gln Glu
1 5 10 15

Trp Thr Asp Ala Tyr Leu Arg Trp Asp Pro Asn Ala Tyr Gly Gly Leu
20 25 30

Asp Ala Ile Arg Ile Pro Ser Ser Leu Val Trp Arg Pro Asp Ile Val
35 40 45

Leu Tyr Asn Lys
50

<210> 59
<211> 27
<212> PRT
<213> Homo sapiens

<400> 59

His Phe Val Ala Leu Phe Ser Gln Asp Trp Lys Phe Val Leu Gln Ile
1 5 10 15

Leu Tyr Lys Leu Cys Leu Phe Phe Val Leu Ile
20 25

<210> 60
<211> 40
<212> PRT
<213> Homo sapiens

<400> 60

Leu Met Gln Val Trp Asp Asn Pro Phe Ile Asn Trp Asn Pro Lys Glu

1 5 10 15
 Cys Val Gly Ile Asn Lys Leu Thr Val Leu Ala Glu Asn Leu Trp Leu
 20 25 30

Pro Asp Ile Phe Ile Val Glu Ser
 35 40

<210> 61
 <211> 37
 <212> PRT
 <213> Homo sapiens

<400> 61

Arg Glu Pro Asn Ser Phe Phe His Asn Gly Ile Asn Ser Thr His Asn
 1 5 10 15

Thr Gly Trp Pro Asn His Leu Leu Lys Val Ser Tyr Leu Asn Thr Phe
 20 25 30

Thr Met Thr Ile Lys
 35

<210> 62
 <211> 52
 <212> PRT
 <213> Homo sapiens

<400> 62

Thr Leu Ile Glu Cys Ser Met Leu Asn Leu Val Asn Leu Val Leu Asn
 1 5 10 15

Arg His Asp Val Leu Ala Arg Ser Ile Phe Phe Gln Thr Thr Val Trp
 20 25 30

Thr Ser Ile Thr Ser Glu Lys Gly Glu Leu Pro Leu Val Ala Ser Val
 35 40 45

Thr Gln Lys Asp
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<210> 63
 <211> 42
 <212> PRT
 <213> Homo sapiens

<400> 63

Cys Ile Ser Asp Leu Gly Ile Phe His Tyr Ser Tyr Gln Leu Ser Ile
 1 5 10 15

Ser Asn Pro Glu Asn Pro Lys His Ser Asn Glu His Phe Leu Val Ser
 20 25 30

His Trp Tyr Ser Lys Asn Phe Arg Phe Trp
 35 40

<210> 64
 <211> 57
 <212> PRT
 <213> Homo sapiens

<400> 64

Ser Ser His Val Leu Pro Pro Tyr Phe Pro Leu Leu Gly Ile Leu Pro
 1 5 10 15
 Arg Pro Ser Phe Phe Thr Arg Pro Val Thr Glu Tyr Thr Leu Met Arg
 20 25 30
 Pro Lys Pro Phe Leu Asn Ser Asn Ser Lys Ser Met Asp Ser Phe Phe
 35 40 45
 Leu Phe His Thr Tyr Ser Cys His Ser
 50 55

<210> 65
 <211> 97
 <212> PRT
 <213> Homo sapiens

<400> 65

Pro Glu Thr Asn Ile Gly Ser Cys Leu Glu Thr Ser His Ser Ile His
 1 5 10 15
 Ser Glu Arg Lys Leu Thr Gln Gly Pro Arg Gln Leu Leu Asn Pro Lys
 20 25 30
 Gln Leu Gln Glu Gly Thr Ile Leu Arg Thr Gln Pro Leu Ser Tyr Cys
 35 40 45
 Ile Leu Leu Glu Gly Pro Ile Ala Pro Val Ser Ser His Pro Trp Ser
 50 55 60
 Pro Ile Asp Ile Leu His Leu Tyr Ser Pro Pro Gln Leu Ala Leu Leu
 65 70 75 80
 Pro Arg Pro Lys Cys Lys Pro Leu Ser Val Thr Gln Leu Pro Pro Val
 85 90 95

Ala

<210> 66
 <211> 21
 <212> PRT
 <213> Homo sapiens

<400> 66

Pro Ala Arg Arg Ser Glu Arg Val Tyr Glu Cys Cys Lys Glu Pro Tyr
 1 5 10 15
 Pro Asp Val Thr Phe
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<210> 67
 <211> 85
 <212> PRT
 <213> Homo sapiens

<400> 67

Asn Ala Pro Ala Ile Thr Arg Ser Ser Cys Arg Val Asp Val Ala Ala
 1 5 10 15

Phe Pro Phe Asp Ala Gln His Cys Gly Leu Thr Phe Gly Ser Trp Thr
 20 25 30

His Gly Gly His Gln Leu Asp Val Arg Pro Arg Gly Ala Ala Ala Ser
 35 40 45

Leu Ala Asp Phe Val Glu Asn Val Glu Trp Arg Val Leu Gly Met Pro
 50 55 60

Ala Arg Arg Arg Val Leu Thr Tyr Gly Cys Cys Ser Glu Pro Tyr Pro
 65 70 75 80

Asp Val Thr Phe Thr
 85

<210> 68
 <211> 42
 <212> PRT
 <213> Homo sapiens

<400> 68

Ser Leu Ser Leu Ala Gly Lys Tyr Tyr Met Ala Thr Met Thr Met Val
 1 5 10 15

Thr Phe Ser Thr Ala Leu Thr Ile Leu Ile Met Asn Leu His Tyr Cys
 20 25 30

Gly Pro Ser Val Arg Pro Val Pro Ala Trp
 35 40

<210> 69
 <211> 43
 <212> PRT
 <213> Homo sapiens

<400> 69

Gly Arg Leu Ala Leu Lys Leu Phe Arg Asp Leu Phe Ala Asn Tyr Thr
 1 5 10 15

Ser Ala Leu Arg Pro Val Ala Asp Thr Asp Gln Thr Leu Asn Val Thr
 20 25 30

Leu Glu Val Thr Leu Ser Gln Ile Ile Asp Met
 35 40

<210> 70

<211> 31
 <212> PRT
 <213> Homo sapiens

<400> 70

Ala Glu Gly Arg Leu Ala Leu Lys Leu Phe Arg Asp Leu Phe Ala Asn
 1 5 10 15

Tyr Thr Ser Ala Leu Arg Pro Val Ala Asp Thr Asp Gln Thr Leu
 20 25 30

<210> 71
 <211> 43
 <212> PRT
 <213> Homo sapiens

<400> 71

Gln Ser His Pro Phe Leu Tyr Phe Ser Ile Cys Leu Ile Lys Gln Ser
 1 5 10 15

Ser Phe Val Pro Leu Ser Ile Cys His Pro Ser Val Leu Pro Ser Phe
 20 25 30

Phe Pro Gln Thr Ser Phe Tyr Ile Pro Ala Ser
 35 40

<210> 72
 <211> 69
 <212> PRT
 <213> Homo sapiens

<400> 72

His Tyr Val Tyr Leu Tyr Cys Cys Ala Asn Val Thr Thr Ile His Leu
 1 5 10 15

His Asn Phe Phe His Leu Pro Lys Leu Lys Leu Pro Ile Tyr Thr Ile
 20 25 30

Thr Pro Val Ser Pro Cys Pro Gln Leu Leu Ala Thr Thr Met Leu Pro
 35 40 45

Cys Val Ser Met Asn Leu Ala Thr Leu Ser Thr Tyr Lys Asn His Thr
 50 55 60

Val Phe Val Leu Leu
 65

<210> 73
 <211> 42
 <212> PRT
 <213> Homo sapiens

<400> 73

Phe Ser His Ile Leu Asn Ala Tyr Trp Asn Met Tyr Asn Tyr Ile Trp
 1 5 10 15

Asn Val Asp Ala Tyr Thr Ser Val Phe Leu Phe Phe Leu Glu Glu Lys
 20 25 30

Val Tyr Phe Pro Pro Leu Ile Cys Val Asn
 35 40

<210> 74
 <211> 43
 <212> PRT
 <213> Homo sapiens

<400> 74

Glu Thr Asn Tyr Ser Tyr Val Val Ser Ser Leu Pro Ser Ile Phe Phe
 1 5 10 15

Ile Asn Ser Val Ile Ile Pro Cys Leu Leu Phe Phe Phe Ser Glu Phe
 20 25 30

Arg Val Ile Ile Ser Arg Ile Phe Ser Leu Pro
 35 40

<210> 75
 <211> 22
 <212> PRT
 <213> Homo sapiens

<400> 75

Phe Phe Glu Phe Gly Glu Trp Val Leu Glu Thr Val Lys Gly Arg Lys
 1 5 10 15

Tyr Leu Phe Tyr Cys Cys
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<210> 76
 <211> 58
 <212> PRT
 <213> Homo sapiens

<400> 76

Glu Lys Leu Ser Ala Pro Pro Arg Val Ala Lys Arg Gly Ser Gly Gly
 1 5 10 15

Ala Gly Ile Gly Cys Ala Thr Val Ser Phe Phe Gly Gln Thr Glu His
 20 25 30

Ala Ala Pro Asn Asp Ser Ala Ile Phe Leu Pro Phe Pro Glu Pro Arg
 35 40 45

Ala Val Gln Pro Val Ala Ser Phe Pro Asp
 50 55

<210> 77
 <211> 58
 <212> PRT
 <213> Homo sapiens

<400> 77

Trp Gln Ile Ser Leu Leu His Tyr Cys Ser Phe Pro Leu Arg Gly Leu
 1 5 10 15
 Tyr Thr Tyr Ser Ala Phe Pro Cys Asp Trp Gln His Cys Thr Val Gly
 20 25 30
 Gly Ser Val Thr Phe His Phe Ser Asp Ile Gly Leu Val His Val Ile
 35 40 45
 Cys Phe Gly Gln Trp Asn Val Arg Asp Thr
 50 55

<210> 78

<211> 37

<212> PRT

<213> Homo sapiens

<400> 78

Trp Ile Cys Ser Glu Ile Leu Tyr Lys Cys Val Phe Lys Ala Glu Phe
 1 5 10 15
 Leu Gly Phe Asp Trp Leu Gly Cys Val Ile Cys Phe Met Ser Met Ser
 20 25 30
 Tyr Ser Thr Asn Lys
 35

<210> 79

<211> 23

<212> PRT

<213> Homo sapiens

<400> 79

Val Leu Asp Arg Met Phe Leu Trp Leu Asp Leu Val Ser Cys Val Leu
 1 5 10 15
 Gly Ile Tyr Ile Phe Ile Pro
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<210> 80

<211> 54

<212> PRT

<213> Homo sapiens

<400> 80

Gly Asp Cys Arg Met Ala His Ala Glu Gln Lys Leu Met Asp Asp Leu
 1 5 10 15
 Leu Asn Lys Thr Arg Tyr Asn Asn Leu Ile Cys Pro Ala Thr Ser Ser
 20 25 30
 Ser Gln Leu Ile Ser Ile Glu Thr Glu Leu Ser Leu Ala Gln Cys Ile
 35 40 45

Ser Val Val Ser Ala Glu
50

<210> 81
<211> 50
<212> PRT
<213> Homo sapiens

<400> 81

Gly Asp Cys Arg Met Ala His Ala Glu Gln Lys Leu Met Asp Asp Leu
1 5 10 15

Leu Asn Lys Thr Cys Tyr Asn Asn Leu Ile Arg Pro Ala Thr Ser Ser
20 25 30

Ser Gln Leu Ile Ser Ile Gln Thr Ala Leu Ser Leu Ala Gln Cys Ile
35 40 45

Ser Val
50

<210> 82
<211> 34
<212> PRT
<213> Homo sapiens

<400> 82

Gly Asp Cys Arg Met Ala His Ala Glu Gln Lys Leu Met Asp Asp Phe
1 5 10 15

Leu Asn Lys Thr Cys Tyr Asn Asn Leu Ile Arg Pro Ala Thr Ser Ser
20 25 30

Ser Gln

<210> 83
<211> 30
<212> PRT
<213> Homo sapiens

<400> 83

Ala Glu Gln Lys Leu Met Asp Asp Leu Leu Asn Lys Thr Arg Tyr His
1 5 10 15

Asn Leu Ile Pro Pro Ser Arg Gln Leu Leu Thr Ala His Leu
20 25 30

<210> 84
<211> 18
<212> PRT
<213> Homo sapiens

<400> 84

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Leu Asn

<400> 85

Phe Phe Leu Cys Pro His Met Gly Phe Ser Leu Cys Ile Cys Ile Leu
20 25 30

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<210> 86
<211> 39
<212> PRT
<213> Homo sapiens
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<400> 86

Glu Phe Thr Trp Leu Arg Arg Asn Asp Ser Val His Gly Leu Glu Thr
1 5 10 15

Leu Trp Leu Ala Tyr Thr Ile Gln Trp Tyr Phe Thr Leu Asp Thr Arg
20 25 30

Leu Gln Gln Glu Thr Gly Asn
35

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<210> 87
<211> 54
<212> PRT
<213> Homo sapiens
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<400> 87

Gly Leu Thr Ser Met Leu Ile Leu Thr Thr Ile Asp Ser His Leu Arg
1 5 10 15

Asp Lys Leu Pro Asn Ile Ser Cys Ile Lys Ala Ile Asp Ile Tyr Ile
20 25 30

Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Leu Glu Tyr Val Tyr
35 40 45

Ile Asn Tyr Leu Phe Tyr
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<210> 88
<211> 42
<212> PRT
<213> Homo sapiens

<400> 88

Leu Ser Phe Ile Ser Glu Thr Lys Gln Lys Pro Leu Asn Gly Trp Phe
1 5 10 15

Leu Asn Ile Leu Pro Gln Thr Phe Pro Leu Thr Cys Ile Arg Ile His
20 25 30

Phe Gly Gly Pro Pro Leu Cys Leu Gly Met
35 40

<210> 89
<211> 43
<212> PRT
<213> Homo sapiens

<400> 89

Leu Phe Leu Phe Val Ser Phe Leu Phe Leu Gln Pro Leu Met Glu Tyr
1 5 10 15

Gly Thr Leu His Tyr Phe Thr Ser Asn Gln Lys Gly Lys Thr Ala Thr
20 25 30

Lys Asp Arg Lys Leu Lys Asn Lys Ala Ser Val
35 40

<210> 90
<211> 94
<212> PRT
<213> Homo sapiens

<400> 90

Leu Ala Ser Trp Pro Pro Val Asp His Phe Cys Arg Gln Asp Ser Gln
1 5 10 15

Lys Gly Asn His Ser Leu Asn Phe Tyr Arg Ile Ile Phe Tyr Leu Lys
20 25 30

Arg His Val His Lys Trp Gln Asp Ala Gln His Thr Ser Phe Tyr Cys
35 40 45

Val Ser Leu Tyr Cys Thr Ser Gln Ile Leu His Phe Leu Thr Asn Gly
50 55 60

Arg Phe Leu Ala Thr Leu Cys Gln Ala Asn Leu Ser Val Pro Phe Val
65 70 75 80

Gln Gln His Ala Leu Pro Ser Cys Leu Trp Val Thr Phe Trp

85

90

<210> 91
 <211> 44
 <212> PRT
 <213> Homo sapiens

<400> 91

Arg Val Asp Gln Asp Gly His Val Lys Leu Asn Leu Ala Leu Thr Thr
 1 5 10 15

Glu Thr Asn Cys Asn Phe Glu Leu Leu His Phe Pro Arg Asp His Ser
 20 25 30

Asn Cys Ser Leu Ser Phe Tyr Ala Leu Ser Asn Thr
 35 40

<210> 92
 <211> 44
 <212> PRT
 <213> Homo sapiens

<400> 92

Arg Val Asp Gln Asp Gly His Val Lys Leu Asn Leu Ala Leu Thr Thr
 1 5 10 15

Glu Thr Asn Cys Asn Phe Glu Leu Leu His Phe Pro Arg Asp His Ser
 20 25 30

Asn Cys Ser Leu Ser Phe Tyr Ala Leu Ser Asn Thr
 35 40

<210> 93
 <211> 59
 <212> PRT
 <213> Homo sapiens

<400> 93

Leu Glu Phe Ser Pro Ile Phe Tyr Cys Leu Arg Leu Ser Ser Phe Leu
 1 5 10 15

Trp Leu Ala Tyr Arg Leu Ser Pro Gln Pro Gly Tyr Leu Asp Phe Leu
 20 25 30

Glu Phe Ser Pro Ile Phe Tyr Phe Leu Ser Leu Ser Cys Phe Leu Trp
 35 40 45

Leu Ala Tyr Arg Leu Ser Pro Gln Pro Gly Tyr
 50 55

<210> 94
 <211> 38
 <212> PRT
 <213> Homo sapiens

<400> 94

Phe Asn Phe Pro Pro Phe Asn Leu Val Cys Phe Thr Pro His Cys Leu
1 5 10 15

Leu Arg Ile Asp Val Cys Thr Gln Leu Phe Leu Trp Thr Gln Pro Thr
20 25 30

Leu Ser Leu His Ile Leu
35

<210> 95

<211> 46

<212> PRT

<213> Homo sapiens

<400> 95

Ala Ser Arg Arg Cys Asn Ile Val Ala Met Cys Pro Glu Ser Val Pro
1 5 10 15

Ser Gly Gly Phe Leu Val Ser Leu Thr Ser Arg Met Lys Pro Trp Thr
20 25 30

Leu Thr Val Ser Val Ala Val Leu Lys Asp Gly Val Ser Gly
35 40 45

<210> 96

<211> 43

<212> PRT

<213> Homo sapiens

<400> 96

Gly Ala Ile Leu Thr Asn Glu Thr Trp Glu Lys Leu Ala Gly Glu Leu
1 5 10 15

Val Gly Tyr Phe Pro Phe Ala Leu Lys Gly Ala Lys Glu Arg Tyr Ile
20 25 30

Pro Phe Phe Phe Pro Phe Ser Ser Leu Asp Val
35 40

<210> 97

<211> 164

<212> PRT

<213> Homo sapiens

<400> 97

Lys Arg Glu Cys His Gln Arg Arg Pro Lys Glu Gln Ile Leu Thr Leu
1 5 10 15

Gln Glu Lys Leu Trp Ala Arg Gln Lys Glu Lys Asp Gln Leu Phe Leu
20 25 30

Gln Leu Lys Lys Val Ser Met Arg Lys Lys Asn Gly Gly Glu Arg Ser
35 40 45

Arg Ala Thr Pro Ser Asp Ile Arg Cys Glu Pro Ala Glu Pro Asp Tyr

50

55

60

Ser Arg Gly Asp Ser Leu Pro Pro Arg His Ala Gly Ser Ala Gly Gly
65 70 75 80

His Asp Arg Pro Gly Ile Val Ile Ala Ala Asp Pro Ala Lys Gln Met
85 90 95

Phe Arg Pro His Val Leu Thr Thr Arg Lys Ser Val Gly Ser Ala Ala
100 105 110

Ala Phe Ala Gly Thr Pro Glu Gln Ala Ala Trp Ala Val Pro Leu Gly
115 120 125

Leu Leu Ser Pro Tyr Leu Asn Met Gly Pro His Ser Pro Met Ala Leu
130 135 140

Val Gly Ser Ser Glu Gln Phe Ser Ala Pro Trp Gly Ala Phe Met Ser
145 150 155 160

Gln Pro Gln Pro

<210> 98

<211> 104

<212> PRT

<213> Homo sapiens

<400> 98

Gly Ser Ala Gly Gly His Asp Arg Pro Gly Ile Val Ile Ala Ala Asp
1 5 10 15

Pro Ala Lys Gln Met Phe Arg Pro His Val Leu Thr Thr Arg Lys Ser
20 25 30

Val Gly Ser Ala Ala Ala Phe Ala Gly Thr Pro Glu Gln Ala Ala Trp
35 40 45

Ala Val Pro Leu Gly Leu Leu Ser Pro Tyr Leu Asn Met Gly Pro His
50 55 60

Ser Pro Met Ala Leu Val Gly Ser Ser Glu Gln Phe Ser Ala Pro Trp
65 70 75 80

Gly Ala Phe Met Ser Gln Pro Gln Pro Tyr Val Leu Leu Gly His Phe
85 90 95

Gln His Thr Gln Thr Gly Phe Leu
100

<210> 99

<211> 62

<212> PRT

<213> Homo sapiens

<400> 99

Cys Ile Glu Ala Pro Phe His Leu His Thr Arg Val Cys Ile Ser Phe

1 5 10 15
 Leu Pro Ser Phe Ile His Tyr Leu Leu Ile Ile Phe Val Tyr Leu Phe
 20 25 30
 Ser Phe Leu Leu Gly Pro Ala Arg Leu Val Phe Cys Leu Cys Ala Leu
 35 40 45
 Val Thr Ser Ala Ser Gln Ile Ala Gly Thr Thr Gly Asp Leu
 50 55 60

<210> 100
 <211> 94
 <212> PRT
 <213> Homo sapiens
 <400> 100

Gln Glu Glu Asp Ile Ile Gln Glu Ser Arg Phe Tyr Phe Arg Gly Tyr
 1 5 10 15
 Gly Leu Gly His Cys Leu Gln Ala Arg Asp Gly Gly Pro Met Glu Gly
 20 25 30
 Ser Gly Ile Tyr Ser Pro Gln Pro Pro Ala Pro Leu Leu Arg Glu Gly
 35 40 45
 Glu Thr Thr Arg Lys Leu Tyr Val Asp Ala Lys Arg Ile Asp Thr Ile
 50 55 60
 Ser Arg Ala Val Phe Pro Phe Thr Phe Leu Ile Phe Asn Ile Phe Tyr
 65 70 75 80
 Trp Val Val Tyr Lys Val Leu Arg Ser Glu Asp Ile His Gln
 85 90

<210> 101
 <211> 43
 <212> PRT
 <213> Homo sapiens
 <400> 101

Glu Asn Arg Cys His Thr Val Cys Asn Ser Lys Ser Asp Leu Asp Val
 1 5 10 15
 Gln Ser Ser Gly Ser Phe Pro Lys Ala Phe His Val Trp Leu Pro Ser
 20 25 30
 Cys Ser Gly Asn Thr Ser Gln Val Asp Gly Gly
 35 40

<210> 102
 <211> 71
 <212> PRT
 <213> Homo sapiens
 <400> 102

00069US1.ST25

Ala Ile Lys Pro Ser Leu Gly Val Trp Ser Val Ser Glu Val Tyr Ser
1 5 10 15

His Cys Lys Trp Ile Leu Thr Val Met Val Asn Thr Pro Gly Gln Arg
20 25 30

Met Gly His Ala His Ser Tyr Trp Lys Asp Leu Glu His Phe Pro Val
35 40 45

Asn Cys Ile Leu Phe Gly Phe Ile Ser Leu Thr Glu Trp Thr Phe Phe
50 55 60

Tyr Met Leu Pro Asn Leu Pro
65 70

<210> 103

<211> 1779

<212> DNA

<213> Homo sapiens

<400> 103

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tttcaccatc aattgctcag ggtttggcca gcacggggcg gatccactg ctctgaattc	180
agtgtttaat agaaagccct tccgtccggt caccaacatc agcgtcccca cccaagtcaa	240
catctccttc gcgatgtctg ccatcctaga tgtgaatgaa cagctgcacc tcttgtcatc	300
attcctgtgg ctggaaatgg tttgggataa cccatttatc agctggaacc cagagggaatg	360
tgaggggcac acgaagatga gtatggcagc caagaacctg tggctcccag acattttcat	420
cattgaactc atggatgtgg ataagacccc aaaaggcctc acagcatatg taagtaatga	480
aggtcgcac aggtataaga aacccatgaa ggtggacagt atctgtaacc tggacatctt	540
ctacttcccc ttcgaccagc agaactgcac actcaccttc agctcattcc tctacacagt	600
ggacagcatg ttgctggaca tggagaaaga agtgtgggaa ataacagacg catcccgga	660
catccttcag acccatggag aatgggagct cctgggcctc agcaaggcca cgcgaaagtt	720
gtccagggga ggcaacctgt atgatcagat cgtgttctat gtggccatca ggcgaggcc	780
cagcctctat gtcataaacc ttctcgtgcc cagtggcttt ctggttgcca tcgatgccct	840
cagcttctac ctgccagtga aaagtgggaa tcgtgtccca ttcaagataa cgctcctgct	900
gggtacaac gtcttctgc tcatgatgag tgacttgctc cccaccagtg gcacccccct	960
catcgggtgc tacttcgccc tgtgcctgtc cctgatgggtg ggcagcctgc tggagaccat	1020
cttcateacc cactgctgc acgtggccac caccagccc ccacccctgc ctcggtggct	1080
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aagggcccag cgggaacacg agggcccagaa gcagcactca gtggagctgt ggttgcaagt 1320
cagccacgcg atggacgcca tgctcttccg cctctacctg ctcttcatgg cctcctctat 1380
catcacgctc atatgcctct ggaacaccta ggcaggtgct cacctgcaa cttcagtctg 1440
gagcttctct tgctccagg gactggccag gtctccccc tttcctgagt accaactatc 1500
atatcccaa agatgactga gtctctgctg tattocatgt atcccaatcc ggtcctgctg 1560
atcaattcca atcccagaca tttctccctg ttctctgatt ttgttggtt ctttcagtcc 1620
taccatatgg ttctaggtcc ctcttacgct atctgcatag cagactatac ctcttctgcc 1680
cgctgacttg cccaataaat aattctgcag agaaaaaaaa aaaaaaaaaa aaaaaaaaaa 1740
aaaaaaaaa aaaaaaaaaa aaaaaagggc ggccgctct 1779

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<210> 104

<211> 999

<212> DNA

<213> Homo sapiens

<400> 104

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gaaatggttt gggataaccc atttatcagc tggaaccacag aggaatgtga gggcatcacg 180
aagatgagta tggcagccaa gaacctgtgg ctcccagaca ttttcatcat tgaactcatg 240
gatgtggata agaccccaaa aggcctcaca gcatatgtaa gtaatgaagg tcgcatcagg 300
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gaccagcaga actgcacact caccttcagc tcattcctct acacagtggg cagcatgttg 420
ctggacatgg agaaagaagt gtgggaaata acagaogcat ccoggaacat ccttcagacc 480
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ttcgccctgt gcctgtccct gatggtgggc agcctgctgg agaccatctt catcaccac 840
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ccgggtctca cccccacca cctgcccgtt gaggtgtga 999

<210> 105

<211> 586

<212> PRT

<213> Homo sapiens

<400> 105

Gly Thr Gly Pro Glu Phe Pro Gly Ser Arg Pro Ala Leu Gly Pro Leu
1 5 10 15

Ser Tyr Arg Glu His Arg Val Ala Leu Leu His Leu Thr His Ser Met
20 25 30

Ser Thr Thr Gly Arg Gly Val Thr Phe Thr Ile Asn Cys Ser Gly Phe
35 40 45

Gly Gln His Gly Ala Asp Pro Thr Ala Leu Asn Ser Val Phe Asn Arg
50 55 60

Lys Pro Phe Arg Pro Val Thr Asn Ile Ser Val Pro Thr Gln Val Asn
65 70 75 80

Ile Ser Phe Ala Met Ser Ala Ile Leu Asp Val Asn Glu Gln Leu His
85 90 95

Leu Leu Ser Ser Phe Leu Trp Leu Glu Met Val Trp Asp Asn Pro Phe
100 105 110

Ile Ser Trp Asn Pro Glu Glu Cys Glu Gly Ile Thr Lys Met Ser Met
115 120 125

Ala Ala Lys Asn Leu Trp Leu Pro Asp Ile Phe Ile Ile Glu Leu Met
130 135 140

Asp Val Asp Lys Thr Pro Lys Gly Leu Thr Ala Tyr Val Ser Asn Glu
145 150 155 160

Gly Arg Ile Arg Tyr Lys Lys Pro Met Lys Val Asp Ser Ile Cys Asn
165 170 175

Leu Asp Ile Phe Tyr Phe Pro Phe Asp Gln Gln Asn Cys Thr Leu Thr
180 185 190

Phe Ser Ser Phe Leu Tyr Thr Val Asp Ser Met Leu Leu Asp Met Glu
195 200 205

Lys Glu Val Trp Glu Ile Thr Asp Ala Ser Arg Asn Ile Leu Gln Thr
210 215 220

His Gly Glu Trp Glu Leu Leu Gly Leu Ser Lys Ala Thr Ala Lys Leu
225 230 235 240

Ser Arg Gly Gly Asn Leu Tyr Asp Gln Ile Val Phe Tyr Val Ala Ile
245 250 255

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Arg Arg Arg Pro Ser Leu Tyr Val Ile Asn Leu Leu Val Pro Ser Gly
      260                      265                      270

Phe Leu Val Ala Ile Asp Ala Leu Ser Phe Tyr Leu Pro Val Lys Ser
      275                      280                      285

Gly Asn Arg Val Pro Phe Lys Ile Thr Leu Leu Leu Gly Tyr Asn Val
      290                      295                      300

Phe Leu Leu Met Met Ser Asp Leu Leu Pro Thr Ser Gly Thr Pro Leu
305                      310                      315                      320

Ile Gly Val Tyr Phe Ala Leu Cys Leu Ser Leu Met Val Gly Ser Leu
      325                      330                      335

Leu Glu Thr Ile Phe Ile Thr His Leu Leu His Val Ala Thr Thr Gln
      340                      345                      350

Pro Pro Pro Leu Pro Arg Trp Leu His Ser Leu Leu Leu His Cys Asn
      355                      360                      365

Ser Pro Gly Arg Cys Cys Pro Thr Ala Pro Gln Lys Glu Asn Lys Gly
      370                      375                      380

Pro Gly Leu Thr Pro Thr His Leu Pro Gly Val Lys Glu Pro Glu Val
385                      390                      395                      400

Ser Ala Gly Gln Met Pro Gly Pro Ala Glu Ala Glu Leu Thr Gly Gly
      405                      410                      415

Ser Glu Trp Thr Arg Ala Gln Arg Glu His Glu Ala Gln Lys Gln His
      420                      425                      430

Ser Val Glu Leu Trp Leu Gln Phe Ser His Ala Met Asp Ala Met Leu
      435                      440                      445

Phe Arg Leu Tyr Leu Leu Phe Met Ala Ser Ser Ile Ile Thr Val Ile
      450                      455                      460

Cys Leu Trp Asn Thr Ala Gly Ala His Leu Pro Thr Ser Val Trp Ser
465                      470                      475                      480

Phe Ser Cys Leu Gln Gly Leu Ala Arg Ser Pro Pro Phe Pro Glu Tyr
      485                      490                      495

Gln Leu Ser Tyr Pro Gln Arg Leu Ser Leu Cys Cys Ile Pro Cys Ile
      500                      505                      510

Pro Ile Arg Ser Cys Ser Ile Pro Ile Pro Asp Ile Ser Pro Cys Ser
      515                      520                      525

Cys Ile Leu Leu Ala Ser Phe Ser Pro Thr Ile Trp Phe Val Pro Leu
530                      535                      540

Thr Ser Ser Ala Gln Thr Ile Pro Leu Leu Pro Ala Asp Leu Pro Asn
545                      550                      555                      560

Lys Phe Cys Arg Glu Lys Lys Lys Lys Lys Lys Lys Lys Lys Lys Lys

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565

570

575

Lys Lys Lys Lys Lys Lys Arg Ala Ala Ala
580 585

<210> 106

<211> 332

<212> PRT

<213> Homo sapiens

<400> 106

Gly Ile Pro Gly Met Val Thr Asn Ile Ser Val Pro Thr Gln Val Asn
1 5 10 15

Ile Ser Phe Ala Met Ser Ala Ile Leu Asp Val Asn Glu Gln Leu His
20 25 30

Leu Leu Ser Ser Phe Leu Trp Leu Glu Met Val Trp Asp Asn Pro Phe
35 40 45

Ile Ser Trp Asn Pro Glu Glu Cys Glu Gly Ile Thr Lys Met Ser Met
50 55 60

Ala Ala Lys Asn Leu Trp Leu Pro Asp Ile Phe Ile Ile Glu Leu Met
65 70 75 80

Asp Val Asp Lys Thr Pro Lys Gly Leu Thr Ala Tyr Val Ser Asn Glu
85 90 95

Gly Arg Ile Arg Tyr Lys Lys Pro Met Lys Val Asp Ser Ile Cys Asn
100 105 110

Leu Asp Ile Phe Tyr Phe Pro Phe Asp Gln Gln Asn Cys Thr Leu Thr
115 120 125

Phe Ser Ser Phe Leu Tyr Thr Val Asp Ser Met Leu Leu Asp Met Glu
130 135 140

Lys Glu Val Trp Glu Ile Thr Asp Ala Ser Arg Asn Ile Leu Gln Thr
145 150 155 160

His Gly Glu Trp Glu Leu Leu Gly Leu Ser Lys Ala Thr Ala Lys Leu
165 170 175

Ser Arg Gly Gly Asn Leu Tyr Asp Gln Ile Val Phe Tyr Val Ala Ile
180 185 190

Arg Arg Arg Pro Ser Leu Tyr Val Ile Asn Leu Leu Val Pro Ser Gly
195 200 205

Phe Leu Val Ala Ile Asp Ala Leu Ser Phe Tyr Leu Pro Val Lys Ser
210 215 220

Gly Asn Arg Val Pro Phe Lys Ile Thr Leu Leu Leu Gly Tyr Asn Val
225 230 235 240

Phe Leu Leu Met Met Ser Asp Leu Leu Pro Thr Ser Gly Thr Pro Leu
245 250 255

Ile Gly Val Tyr Phe Ala Leu Cys Leu Ser Leu Met Val Gly Ser Leu
 260 265 270

Leu Glu Thr Ile Phe Ile Thr His Leu Leu His Val Ala Thr Thr Gln
 275 280 285

Pro Pro Pro Leu Pro Arg Trp Leu His Ser Leu Leu Leu His Cys Asn
 290 295 300

Ser Pro Gly Arg Cys Cys Pro Thr Ala Pro Gln Lys Glu Asn Lys Gly
 305 310 315 320

Pro Gly Leu Thr Pro Thr His Leu Pro Gly Glu Val
 325 330

<210> 107

<211> 485

<212> DNA

<213> Homo sapiens

<400> 107

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gggcccggca tctgccctgc tgatacctct ggctccttca cacctacaga aagacagaga 180

ctcagccatg ggctgcaaat gtcacctgtg gagggaggga gacaggggaag gaggcaggag 240

cagagaagtg gaggtggggg aagaggaatg tgacttccct caccgggcag gtgggtgggg 300

ggtgagacct gggcccttat tttccttctg gggcgcagtg ggacagcatc tccccgggct 360

gttgagctgg agcagcaggg agtggagcca ccgaggcagg ggtgggggct ggggtggtggc 420

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gcaca 485

<210> 108

<211> 584

<212> DNA

<213> Homo sapiens

<400> 108

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cctgggtggtg cgctgtagt cccagctact tgggaggctg aggctgagac aggaggatca 180

tttgagccca ggacatggaa gttgcagtga gctgagagca tgccactcta ctccagcctg 240

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gcgggccctg cctcttgcgt tatctctcct ccagcatgga tgtggataaa accccaaaag 360

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 agagcaacca acaaatttaa agaaactatg agtaaatggt gacc 584

<210> 109
 <211> 38
 <212> PRT
 <213> Homo sapiens

<400> 109

Cys Leu Ser Leu Met Val Gly Ser Leu Leu Glu Thr Ile Phe Ile Thr
 1 5 10 15

His Leu Leu His Val Ala Thr Thr Gln Pro Pro Pro Leu Pro Arg Trp
 20 25 30

Leu His Ser Leu Leu Leu
 35

<210> 110
 <211> 60
 <212> PRT
 <213> Homo sapiens

<400> 110

Leu Ser Ser Ser Met Asp Val Asp Lys Thr Pro Lys Gly Leu Thr Ala
 1 5 10 15

Tyr Val Ser Asn Glu Gly Arg Ile Arg Tyr Lys Lys Pro Met Lys Gly
 20 25 30

Asp Ser Ile Cys Asn Leu Asp Ile Phe Tyr Phe Pro Phe Asp Gln Gln
 35 40 45

Asn Cys Thr Leu Thr Phe Ser Ser Phe Leu Tyr Thr
 50 55 60

<210> 111
 <211> 30
 <212> DNA
 <213> Artificial

<220>
 <223> Probe/Primer

<400> 111
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<210> 112
 <211> 22
 <212> DNA

<213> Artificial

<220>

<223> Probe/Primer

<400> 112

cccagcctct atgtcataaa cc

22

<210> 113

<211> 20

<212> DNA

<213> Artificial

<220>

<223> Probe/Primer

<400> 113

tcatgagcag gaagacgttg

20

<210> 114

<211> 19

<212> DNA

<213> Artificial

<220>

<223> Probe/Primer

<400> 114

gccatcaggc gcaggccaa

19

<210> 115

<211> 23

<212> DNA

<213> Artificial

<220>

<223> Probe/Primer

<400> 115

caagtcattc atcatgagca gga

23

<210> 116

<211> 20

<212> DNA

<213> Artificial

<220>

<223> Probe/Primer

<400> 116

tgccgtgtccc tgatggtggg

20

<210> 117

<211> 19

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<212> DNA

<213> Artificial

<220>

<223> Probe/Primer

<400> 117

gagcagcagg gagtggagc

19